

REMARKS

Claims 1-17 and 30 are pending. By this Amendment, claim 1 has been amended to more fully distinguish the invention of the claims over the teachings of the prior art reference Oishi cited against these claims. In addition, the specification has been amended to correct a typographical error.

No new matter is added. Support for the amendment to claim 1 can be found throughout the original specification, for example at paragraph [0132] and Figures 4, 5, 8 and 10 which describe and show a first rate of flow (Am_1/Am_3)q of the fluid from the master cylinder 10 into brake cylinder 44, 48, which has a predetermined relationship with a second rate of flow q of the fluid from pump device 12 (recited power-operated hydraulic pressure source) into the master cylinder 10, in the first embodiment of Figures 1-10. Figures 15, 16, 19, 21 and 22 show the first and second flow rates in predetermined relationships with each other in the other embodiments.

In view of the foregoing amendments and the following remarks, reconsideration of this application is respectfully requested.

I. Request for Acknowledgement of Information Disclosure Statement

Applicant respectfully requests acknowledgment of the Information Disclosure Statement filed on December 22, 2003. A clean Form PTO-1449 of the Information Disclosure Statement filed on December 22, 2003 is submitted herewith.

II. Rejections Under 35 U.S.C. §102(b)

Claims 1, 10, 11, 15, 16 and 30 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 4,838,619 to Ocvirk (hereinafter referred to as "Ocvirk").

Claims 1, 10, 11, 15, 16 and 30 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by JP 11-91530 (using U.S. Patent No. 6,095,622 to "Oishi"). These rejections are respectfully traversed.

A. Rejection based on Ocvirk

The Patent Office alleges that elements 1, 16, 36 and 39 disclosed in Ocvirk correspond to the recited flow-rate changing device. Applicant respectfully disagrees as Ocvirk fails to teach at least the following three features of the flow-rate changing device recited in amended claim 1:

- (A) a feature that the flow-rate changing device is operable to change a first rate of flow of the fluid from the master cylinder into the brake cylinder;
- (B) a feature that the first rate of flow corresponds to a given second rate of flow of the fluid from the power-operated hydraulic pressure source into the master cylinder and has a predetermined relationship with the second rate of flow; and
- (C) a feature that the flow-rate changing device is operable to change the first rate of flow, to control the fluid pressure in the brake cylinder such that the fluid pressure in the brake cylinder corresponds to the operation of the manually operable brake operating member.

In Ocvirk, the recited first flow rate corresponds to a rate of flow of the fluid from master cylinder 1 (working chambers 4, 5) into wheel brakes 17-20, while the recited second flow rate corresponds to a rate of flow of the fluid from pump 34 into the master cylinder 1 (into the working chambers 4, 5 through supply chamber 12 and supply chambers 10, 11). Although the elements 36, 39 are considered to be capable of changing the second flow rate (in an anti-lock braking-pressure control mode) as mentioned in the previous responses and in the paragraph bridging columns 5 and 6 (in particular, col. 6, lines 6-14) of Ocvirk, these elements 36, 39 are not operable to change the first flow rate, namely, the rate of flow of the

fluid from the master cylinder 1 into the brake cylinders 17-20, which rate of flow corresponds to the given second rate of flow, namely, the rate of flow of the fluid from the pump 34 into the master cylinder 1. Thus, Ocvirk does not teach or suggest a combination of the features (A) and (B) discussed above.

Elements 15, 16 disclosed in Ocvirk (modulators 15, 16) are operable to change the first flow rate in the anti-lock braking-pressure control mode, as described in col. 5, line 64 to col. 6, line 5. However, Ocvirk clearly fails to teach a combination of the features (B) and (C). Described in detail, the modulators 15, 16 (corresponding to control valves 54, 58 disclosed in Figure 1 of the present application) are controlled in the anti-lock braking-pressure control mode, irrespective of the operation of the brake operating member 3, namely, such that the fluid pressure in the brake cylinders 17-20 does not correspond to the operation of the brake pedal 3. Therefore, Ocvirk does not satisfy the feature (C). In the anti-lock braking-pressure control mode, the rate of flow of the fluid from the modulators 15, 16 into the brake cylinders 17-20 (recited first flow rate) is not controlled in a predetermined relationship with the rate of flow of the fluid from the pump 34 in master cylinder 1 (recited second flow rate). Therefore, the reference also fails to teach the feature (B).

Regarding the feature (C), the Patent Office refers to a normal operation of the braking system without controlling the modulators 15, 16, while the magnetic valve 39 is held open (col. 5, lines 43-50). In the normal braking operation with the magnetic valve 39 held open, the pressure control valve 36 is not operable. In other words, the braking system of Ocvirk is operated for a normal braking operation in response to an operation of the brake pedal 3, as if the elements 36, 39 were not provided. While the Patent Office appears to allege that the elements 36, 39 and the elements 1, 15 (15 and 16) cooperate to constitute the recited flow-rate changing device, all of the elements 1, 16, 36 and 39 are never operable so as to satisfy the three features or requirements (A), (B) and (C), at the same time. That is, the

recited flow-rate changing device is operable so as to simultaneously satisfy all of the three requirements (A), (B) and (C), and Ocvirk does not teach or suggest such a device.

For the foregoing reasons, Applicant respectfully submits that Ocvirk fails to anticipate the subject matter of claim 1 and claims dependent therefrom.

Regarding dependent claim 30, the Patent Office alleges that the modulator 16 is considered to be the pressure control valve device recited in claim 30. However, claim 30 requires the claimed braking system to include the flow-rate changing device, in addition to the pressure control device which is used in various brake control modes other than the normal control mode. As discussed above, Ocvirk does not teach the recited flow-rate changing device. In the Response to Arguments section (paragraph 7 of the Office Action), the Patent Office appears to allege that only the elements 1, 36 and 39 function as the recited flow-rate changing device. However, these elements are never operable so as to satisfy the combination of the three requirements (A), (B) and (C), in particular, these elements are not operable to change the recited first fluid flow rate, to change the brake cylinder fluid pressure such that the brake cylinder pressure corresponds to the operation of the manually operable brake operating member.

In the Response to Arguments section, the Patent Office appears to allege that the valve 39 provided in Ocvirk corresponds to the valve 90 shown in Figure 1. Applicant respectfully disagrees. The valve 39 of Ocvirk functions to enable or disable the pressure control valve 39 to operate, depending upon whether a "blocking tendency of a vehicle wheel is detected by the brake slip control device." See col. 5, lines 51-57. On the other hand, the valve 90 in the first embodiment of Figure 1 is provided to prevent a discharge flow of the fluid from the rear pressure chamber 30, for preventing a retracting movement of the piston 18, when the valve 92 is opened to deliver the pressurized fluid from the pump 82 into the pressurizing chamber 26, and for reducing the above-described first fluid flow rate, that is,

when the operating state of the braking system is switched from the first state to the second state. See Figure 10. As explained above, the valve 39 of Ocvirk does not function as the recited flow-rate changing device. In this respect, the Patent Office refers to "closing of valve 39 which is comparable to the closing of valve 90 in figure 1 of the instant application" at page 3, line 4 of the pending Office Action. As discussed in the last paragraph of the response filed on September 11, 2003, the valve 39 of Ocvirk is opened to initiate an anti-lock braking-pressure control operation (col. 5, line 45 describing "by way of the open magnetic valve 39"), while on the other hand, the valve 90 is closed for the purpose described above.

For the foregoing reasons, Applicant respectfully submits that Ocvirk fails to anticipate the subject matter of claim 30.

B. Rejection based on Oishi

The Patent Office alleges that elements 17 and 44 of Oishi correspond to the recited flow-rate changing device. Applicant respectfully disagrees. Oishi discloses a braking system comprising a principal hydraulic pressure source 16 including master cylinder 17 and regulating valve 18. The braking system of Oishi further comprises auxiliary pressure source 24 including pump 30, accumulator 25, and flow control valve or device 44 including pressure regulating valve 44d (as shown in Figure 2). The auxiliary pressure source 24, which corresponds to the power-operated hydraulic pressure source recited in claim 1, is used as a booster to deliver the pressurized fluid from the accumulator 25 into an assisting cylinder 17c of the master cylinder 17 through the regulating valve 18 (col. 4, lines 7-10). The regulating valve 18 regulates the pressure of the pressurized fluid received from the accumulator 25 (via passage 26) according to an operating force of brake operating member 15 (col. 4, lines 11-19).

In a normal braking operation of the braking system of Oishi, wheel brake cylinders 11-14 are operated with the pressurized fluid received from pressure generating chambers 17a, 17b of the master cylinder 17 via passages 22, 23 (col. 5, lines 5-26). The normal braking operation will be described in detail, in connection with the amendment to claim 1.

In an anti-lock braking-pressure control mode (col. 5, lines 27-30), wheel brake cylinders 11-14 having a locking tendency are operated with the pressurized fluid received from the regulating device 18 via passages 27, 45 (col. 5, line 27 to col. 6, line 8). More precisely, the pressurized fluid is received from the regulating device 18 via the passages 27, 45 and passage 44a in the flow control device 44 while the normally open valve 44c is held open. Although the passage 45 is connected to the passage 44a of the flow control device 44, this device 44 neither functions to change the second flow rate recited in claim 1, nor controls the fluid pressure in brake cylinders 11-14 in the anti-lock braking-pressure control mode, such that the brake cylinder pressure corresponds to an operation of the brake operating member 15. In the anti-lock braking-pressure control mode, the brake cylinder pressure is controlled irrespective of the operation of the brake pedal 15. Thus, the elements 17, 44 alleged by the Patent Office to be the recited flow-rate changing device, do not meet the requirements (B) and (C) of claim 1 described above.

In a traction control mode or a vehicle-body stability maintaining control mode (col. 6, lines 9-11), the appropriate wheel brake cylinders 11-14 are operated with the pressurized fluid received from the accumulator 25 via passages 26, 45 and 44a. See col. 6, lines 9-49 of Oishi. Since the fluid is delivered to the appropriate wheel brake cylinders 11-14 via the non-restricted passage 44a, the brake cylinder pressure is rapidly increased (col. 7, lines 46-49, and col. 2, lines 13-16; curve A in Figure 4). In these two modes, too, the wheel brake cylinder is controlled irrespective of the operation of the brake operating member. The

elements 17, 44 do not meet the requirements (B) and (C). Further, the elements 17, 44 do not meet requirement (A), since the pressurized fluid delivered from the master cylinder 17 is not delivered to the brake cylinders 11-14 in the two modes in question, but the pressurized fluid is delivered from the accumulator 25 into the brake cylinders. Thus, the elements 17, 44 do not satisfy any of the three features or requirements (A), (B) and (C) recited in claim 1.

In the vehicle-constant speed cruising control mode or the inter-vehicle distance control mode (col. 6, lines 50-52), the valve 44c of the flow control device 44 is closed (col. 7, lines 49-52), so that the pressurized fluid is delivered from the accumulator 25 into the appropriate wheel brake cylinders 11-14 via passage 26, 44b, 45, that is, through the pressure reducing valve 44d (proportioning valve described at col. 7, lines 10-11), so that the brake cylinder pressure can be increased slowly (col. 8, lines 4-6; and curve B in Fig. 4). In these two modes, too, the brake cylinder pressure is controlled irrespective of the operation of the brake operating member, so that the elements 17, 44, do not meet the requirements (B) and (C). Further, the elements 17, 44 do not meet the requirement (A), since the pressurized fluid delivered from the master cylinder 17 is not delivered to the brake cylinders 11-14 in the two modes in question, but the pressurized fluid is delivered from the accumulator 25 into the brake cylinders. Thus, the elements 17, 44 do not satisfy any of the three features or requirements (A), (B) and (C) recited in claim 1.

Turning back to the normal braking operation in the braking system of Oishi wherein the pressurized fluid is delivered from the chambers 17a, 17b of the master cylinder 17 into the brake cylinders 11-14 via the passages 22, 23, the brake cylinder pressure is controlled such that the brake cylinder pressure corresponds to the operation of the brake pedal 15. In the normal braking operation according to the operation of the brake pedal 15, the fluid pressure in the passage 27 connected to the assisting chamber 17c is increased by the regulating valve 18, by "isolating the passage 27 from a passage 28 which is in continual fluid

communication with the reservoir 19" (col. 4, lines 19-24), and is decreased by the regulating valve 18, by "establishing fluid communication of the passage 28 with the passage 27 and a concurrent isolation of the passage 27 from the passage 26" (col. 4, lines 24-29). In this arrangement of control of the fluid pressure in the assisting chamber 17c (in the master cylinder chambers 17a, 17b), the recited first rate of flow of the fluid from the master cylinder 17 into the brake cylinders 11-14 may change or vary for the recited given second rate of flow of the fluid from the accumulator 25 into the master cylinder 17, although this change or variation of the first flow rate is not intended by Oishi, which uses the regulating valve 18 for the purpose of controlling the fluid pressure in the chambers 17a, 17b depending upon the brake pedal depression force (col. 4, line 7-19).

However, amended claim 1 recites the feature or requirement (B) that the first flow rate which is changed by the flow-rate changing device has a predetermined relationship with the second flow rate. In the first embodiment of Figures 1-10 of the invention, the pressurized fluid generated by the pump 82 is delivered into the rear pressure chamber 30 of the master cylinder 10 (step S2 in the flow chart of Figure 9) until the master cylinder pressure P_1 has increased to a threshold value P_{1S} corresponding to the maximum delivery pressure P_{max} of the pump 82, that is, until an affirmative decision (YES) is obtained in step S1 in the flow chart of Figure 9. After the master cylinder pressure has increased to the threshold value, the pressurized fluid is delivered from the pump 82 into the pressurizing chamber 18 of the master cylinder (step S5), so that the rate of flow of the pressurized fluid from the master cylinder into the brake cylinder is lowered from a relatively high value $(A_{m1}/A_{m3})q$ to a relatively low value q , as indicated in Figures 4 and 10. It will be understood that the flow rate q has a predetermined relationship with the flow rate $(A_{m1}/A_{m3})q$. In other words, the flow-rate changing device 10, 88, 90, 92, 150 is operable to change a first rate of flow of the fluid from the master cylinder 10 into the brake cylinder 44, 48, which first rate

corresponds to a given second rate of flow of the fluid from the power-operated hydraulic pressure source 82, 84 into the master cylinder and which has a predetermined relationship with the second rate of flow. Therefore, the principal hydraulic pressure source 16, 17, 18 is not operable, even in the normal braking operation, to change the rate of flow of the master cylinder 17 into the brake cylinders 11-14 in the manner as recited in amended claim 1.

Accordingly, Oishi fails to teach all three features (A), (B) and (C) of the flow-rate changing device recited in amended claim 1 with respect to the normal braking operation.

For the foregoing reasons, Applicant respectfully submits that Oishi fails to anticipate the subject matter of claim 1 and claims dependent therefrom.

Regarding dependent claim 30, the Patent Office alleges that pressure control valve device 38a (more precisely, 38a-38d, 39a-39d) is considered to be the pressure control valve device recited in claim 30. However, claim 30 requires the claimed braking system to include the flow-rate changing device, in addition to the pressure control device which is used in various brake control modes other than the normal control mode. As discussed above, Oishi does not teach the recited flow-rate changing device.

For the foregoing reasons, Applicant respectfully submits that Oishi fails to anticipate the subject matter of claim 30 and claims dependent therefrom.

For all the foregoing reasons, reconsideration and withdrawal of these rejections are respectfully requested.

III. Allowable Subject Matter

Applicant would like to thank the Examiner for indicating that claims 2-4, 6, 7 and 17 are allowed.

IV. Rejoinder of Withdrawn Claims Requested

Claims 5, 8, 9, 12, 13 and 14 are currently withdrawn from consideration. However, since these claims depend from allowable claim 1, rejoinder is respectfully requested.

V. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-17 and 30 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,


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Attachment:
Form PTO-1449

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